

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-23 (Canceled)

Claim 24 (New): A position detecting method for detecting positions of a plurality of divided areas divided by street lines on the substrate, by using an observation optical system, said position detecting method comprising:

performing image pickup of a boundary between at least one said street lines and at least one of said divided areas on said substrate, while relatively moving said substrate and an observation field of said observation optical system in a direction perpendicular to an optical axis direction of the observation optical system;

detecting a positional change of said boundary in a different direction from a direction of said relative movement, based on image information obtained in said image pickup during the relative movement; and

detecting a positional relation between a reference coordinate system that defines a movement of said substrate, and an arrangement coordinate system that corresponds to an arrangement of said plurality of divided areas on the substrate, based on the detected positional change of said boundary.

Claim 25 (New): The position detecting method according to claim 24, wherein in said performing image pickup, said image pickup of said boundary is performed at regular intervals during said relative movement.

Claim 26 (New): The position detecting method according to claim 24, wherein

said positional change of said boundary is detected in a direction substantially perpendicular to a direction of said relative movement in a two-dimensional plane including the direction of the relative movement.

Claim 27 (New): The position detecting method according to claim 26, wherein the detection of said positional change of said boundary is performed during said relative movement.

Claim 28 (New): The position detecting method according to claim 26, wherein said positional relation is detected, based on a positional change of said at least one of said street lines in a direction perpendicular to the direction of said relative movement while the relative movement is performed.

Claim 29 (New): The position detecting method according to claim 28, wherein prior to the detection of said at least one of said street lines, an outer edge of said substrate is measured, and

based on the measurement result, said positional relation between said reference coordinate system and said arrangement coordinate system is detected with predetermined accuracy lower than accuracy with which the positional relation is detected while the relative movement is performed.

Claim 30 (New): The position detecting method according to claim 29, wherein said substrate is rotated so that an axis direction of said reference coordinate system is parallel to an axis direction of said arrangement coordinate system, based on said positional relation detected with said predetermined accuracy.

Claim 31 (New): The position detecting method according to claim 28, wherein said observation field is relatively moved with respect to said substrate along said at least one of said street lines.

Claim 32 (New): The position detecting method according to claim 31, wherein in the detection of said at least one of said street lines, a positional change of a border between said at least one of said divided areas and said at least one of said street lines within said observation field is measured by observing a moving picture within said observation field while relatively moving said substrate and the observation field, and said positional relation is detected based on the measurement result of the positional change of said border.

Claim 33 (New): The position detecting method according to claim 32, wherein when it is presumed that said border is out of range of said observation field, the relative movement of said substrate and said observation field is corrected so that the border is continuously caught within the observation field.

Claim 34 (New): The position detecting method according to claim 32, wherein in the detection of said at least one of said street lines, an image formed by a total quantity of light that reaches each point within said observation field during a predetermined pickup time is picked up, and said positional change of said border within the observation field is measured based on the pickup result.

Claim 35 (New): The position detecting method according to claim 24, wherein said positional change of said boundary is detected by obtaining image information through picking up an image of said boundary.

Claim 36 (New): The position detecting method according to claim 24, wherein said relative movement of said substrate and said observation field is performed so that a predetermined number of position detection marks, which are chosen from a plurality of position detection marks formed on said at least one of said street lines, are caught within the observation field in predetermined order,  
a position of the chosen predetermined number of position detection mark is detected,  
and  
based on the detection result, said positional relation is detected with higher accuracy than accuracy with which the positional relation is detected while the relative movement is performed.

Claim 37 (New): A position detecting method for detecting positions of a plurality of divided areas divided by street lines on a substrate, by detecting a plurality of position detection marks formed on at least one of said street lines, said position detecting method comprising:

determining a moving route of said substrate to be used for sequential detection of said plurality of position detection marks by using said at least one of said street lines; and  
controlling a movement of said substrate based on the detection result of said at least one of said street lines.

Claim 38 (New): The position detecting method according to claim 37, wherein

an observation field for the detection of said at least one of said street lines is relatively moved with respect to said substrate along said at least one of said street lines.

Claim 39 (New): The position detecting method according to claim 38, wherein in the detection of said at least one of said street lines, a positional change of a border between said at least one of said divided areas and said at least one of said street lines within the observation field is measured, by observing a moving picture within the observation field while relatively moving said substrate and the observation field.

Claim 40 (New): The position detecting method according to claim 39, wherein the detection of said at least one of said street lines comprises:

picking up an image formed by a total quantity of light that reaches each point within said observation field during a predetermined pickup time; and  
measuring a positional change of said border within the observation field based on the pickup result.

Claim 41 (New): A position detecting apparatus that detects a plurality of divided areas divided by street lines on a substrate, said position detecting apparatus comprising:

a substrate stage that holds said substrate;  
an observation system that performs image pickup of said substrate stage by using an observation optical system;  
a driving unit that drives said substrate stage in a direction perpendicular to an optical axis direction of said observation optical system; and  
a processing unit that is electrically connected to the observation system, and obtains a positional relation between a reference coordinate system that defines a movement of the

substrate stage, and an arrangement coordinate system that corresponds to an arrangement of said plurality of divided areas on the substrate, based on image information regarding a boundary between at least one of said street lines and at least one of said divided areas obtained by the observation system while the substrate stage is moved by said driving unit.

Claim 42 (New): The position detecting apparatus according to claim 41, wherein said observation system observes a positional change of said boundary in a direction substantially perpendicular to a moving direction of said substrate stage when moving said substrate stage.

Claim 43 (New): The position detecting apparatus according to claim 42, further comprising:

a control system that is electrically connected to said driving unit, and controls the driving unit so that said at least one of said street lines is detected by said observation system while moving said substrate stage, when detecting a mark on said substrate.

Claim 44 (New): The position detecting apparatus according to claim 43, wherein said control system controls said driving unit so that said observation field of said observation system follows a route to a predetermined position detection mark that is chosen from the position detection marks formed on said at least one of said street lines, and the control system further detects the chosen predetermined position detection mark and detects a position of each divided area based on the detection result of the chosen predetermined position detection mark.

Claim 45 (New): The position detecting apparatus according to claim 44, wherein

said route is along a street line.

Claim 46 (New): The position detecting apparatus according to claim 41, wherein said observation system comprises an image pickup apparatus that obtains image information by performing image pickup of a substrate surface.

Claim 47 (New): An exposure method in which a predetermined pattern is transferred to a divided area on a substrate by emitting an energy beam, said exposure method comprising:

detecting a position of said divided area formed on said substrate by using the position detecting method according to claim 24, prior to said transfer.

Claim 48 (New): An exposure method in which a predetermined pattern is transferred to a divided area on a substrate by emitting an energy beam, said exposure method comprising:

detecting a position of said at least one of said divided areas formed on said substrate by using the position detecting method according to claim 37, prior to said transfer.

Claim 49 (New): An exposure apparatus that transfers a predetermined pattern to a divided area on a substrate by emitting energy beam, said exposure apparatus comprising:

an illumination system that emits said energy beam; and

the position detecting apparatus according to claim 41 that detects a position of said at least one of said divided areas.

Claim 50 (New): A making method of an exposure apparatus that transfers a predetermined pattern to a plurality of divided areas divided by street lines on a substrate, by emitting an energy beam, said method comprising:

providing an illumination system that emits said energy beam;

providing a substrate stage that holds said substrate;

providing an observation system that includes an observation optical system, and performs image pickup of a substrate surface through said observation optical system;

providing a driving unit that drives said substrate stage in a direction perpendicular to an optical axis direction of said observation optical system; and

providing a processing unit that obtains a positional relation between a reference coordinate system that defines a movement of the substrate stage, and an arrangement coordinate system that corresponds to an arrangement of said plurality of divided areas on the substrate, based on image information regarding a boundary between at least one of said street lines and at least one of said divided areas obtained by said observation system while the substrate stage is moved by said driving unit.

Claim 51 (New): The making method according to claim 50, further comprising:

providing a control system that controls said driving unit so that said at least one of said street lines is detected by said observation system while moving said substrate stage, when detecting a mark on said substrate.

Claim 52 (New): A device manufacturing method comprising a lithographic process, wherein

a predetermined pattern is transferred onto a divided area divided by street lines on said substrate, by using the exposure method according to claim 47.



Claim 53 (New): A device manufacturing method comprising a lithographic process,  
wherein

a predetermined pattern is transferred onto a divided area divided by street lines on  
said substrate, by using the exposure method according to claim 48.

Claim 54 (New): A device manufactured by using the device manufacturing method  
according to claim 52.

Claim 55 (New): A device manufactured by using the device manufacturing method  
according to claim 53.